



THE INTEGRATED COUNTERMEASURE ASSESSMENT SYSTEM (ICAS)

Presented to

SCI-130 WORKGROUP

Approved for Public Release; distribution is unlimited

Marc E. Williams
Program Manager
Electronic Combat Range

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 01 DEC 2007		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE The Integrated Countermeasure Assessment System (ICAS) (U)				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) NAVAIR				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADM401231. RTO-MP-SCI-130 Integrated Defensive Aids Systems and Testing (Les systemes integres d'aide a la defense et les essais), The original document contains color images.					
14. ABSTRACT See the report.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 10	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

- Most military aircraft have inadequate or no Missile Warning System.
 - Almost all US aircraft losses since Vietnam have been to MANPADS.
 - MANPADS are cheap, lethal, available and can obstruct US air superiority.
 - MANPADS are a principal weapon of terrorists.
 - Navy EW programs are developing systems to detect and counter threat missile seekers that operate in the infrared or optical bands.
- An open-air, closed loop T&E capability to evaluate IR warning & countermeasures, quantify end-game effectiveness, and evaluate installed, integrated systems in military aircraft is an urgent need.

INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

The ability to evaluate installed EO/IR warning & countermeasures on military aircraft in realistic environments is not available today.

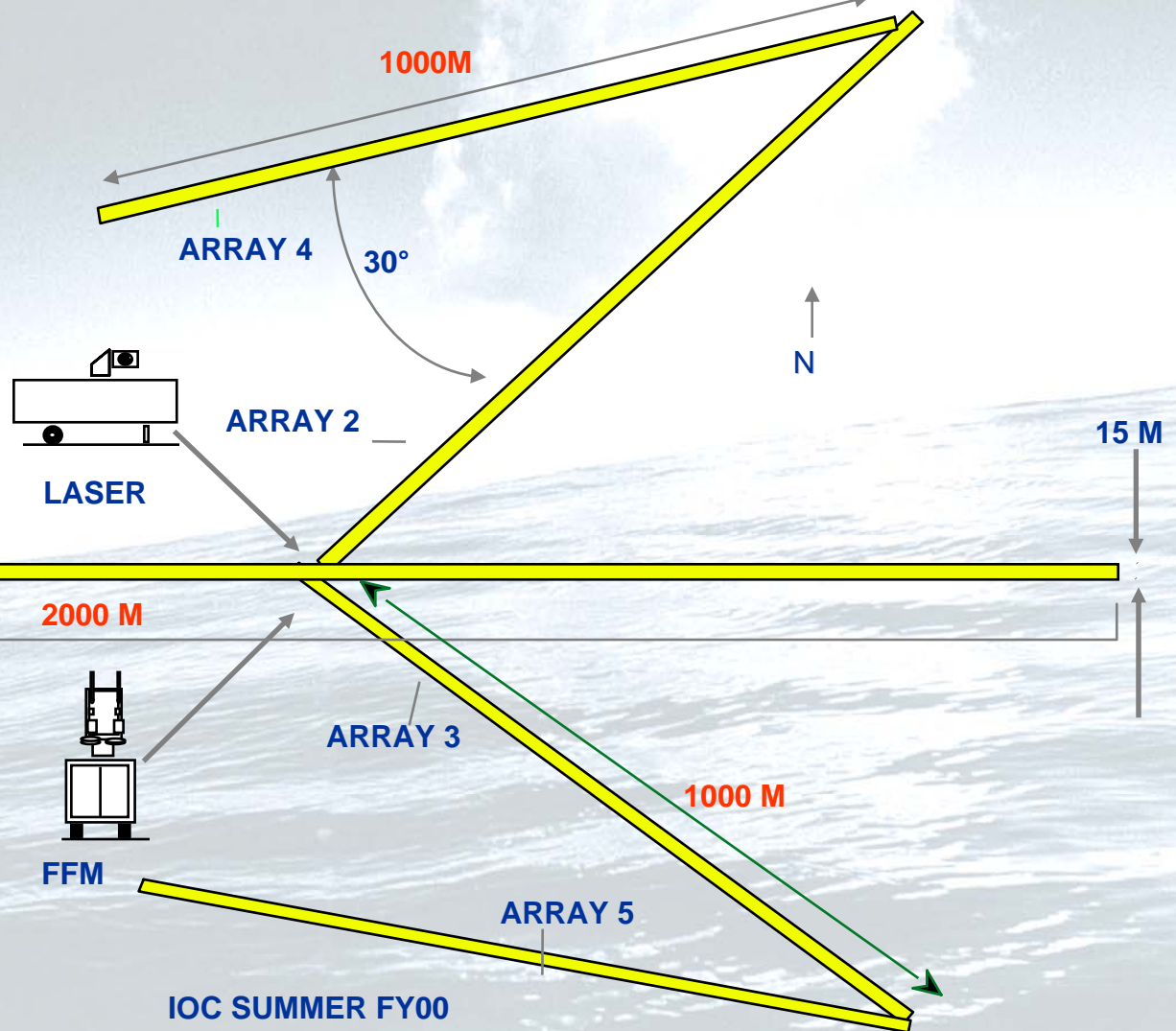
- T&E is conducted incrementally:
 - Hardware-in-the-Loop (HITL) simulations
 - Captive-Carry Seekers (examines Break-Lock only)
 - Open-Loop Static IR Seekers (Break-Lock)
 - Cable car live fire
 - Modeling and Simulation
- Installed systems are far more complex and interact with and/or depend upon many other avionic systems.

INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

ICAS is responsive to this need!

- An open-air facility for installed testing and realistic flight behavior:
- IR and UV Plume Simulation (engages Missile Warning and DIRCM tracker)
- Uses IR seekers and guidance electronics
- Validated missile fly-out models & end-game dynamics (miss distance)
- Calibrated false alarm sources
- Real-time atmospheric & environmental effects
- Real-time IR scene to SPIL presentation (target, CM, environment)
- Precision TSPI & ground truth over a wide area

UV STIMULATOR ARRAY CONFIGURATION

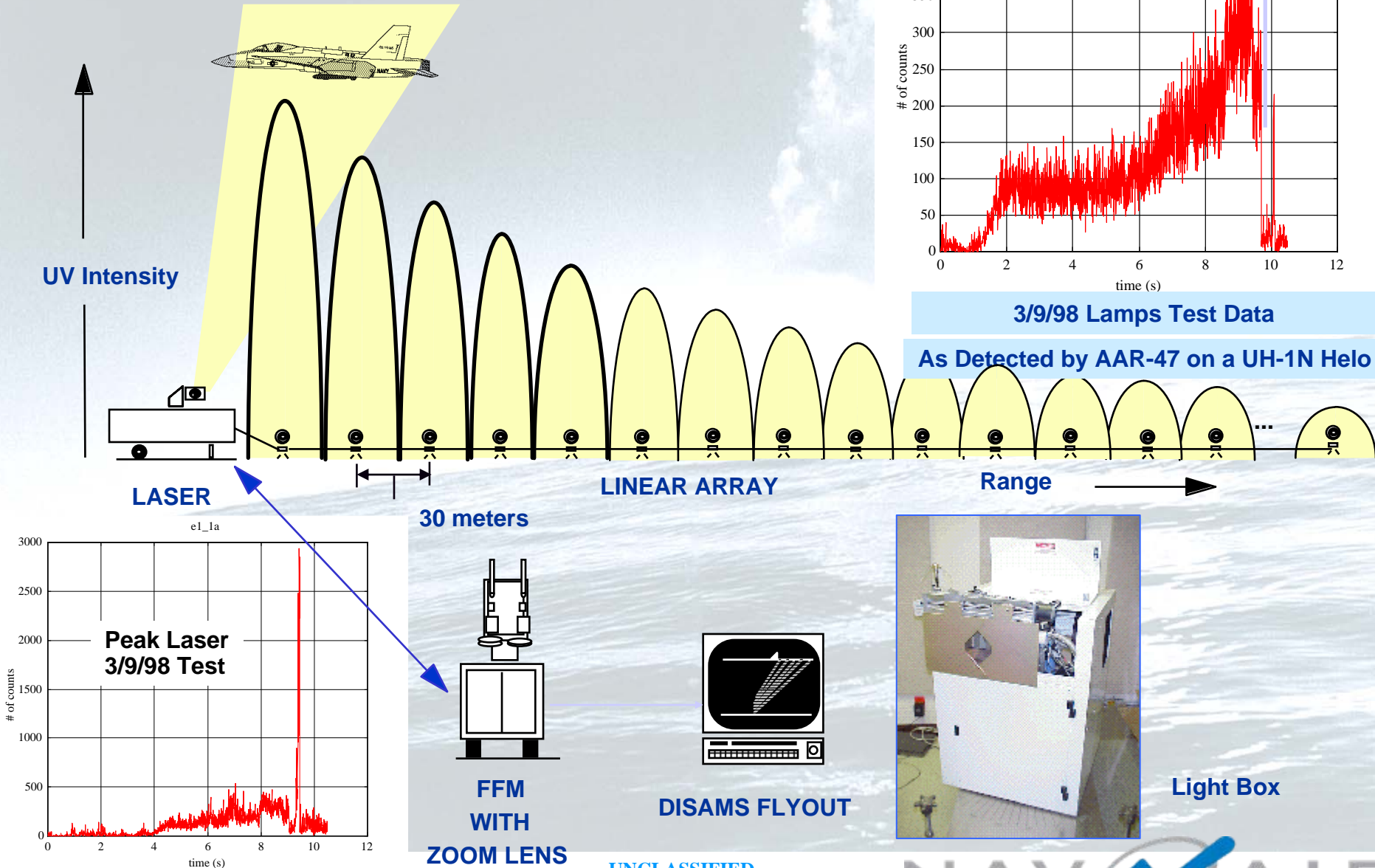


1. Each array will have 208 v 60hz, single phase power drops Spaced at 50 meter interval.
2. Lamps will be spaced at a Minimum of 30 meter interval.
3. Intersection of arrays 1,2, and 3 will contain uv laser and ffm Systems.

UNCLASSIFIED

UV STIMULATOR CONCEPT

MISSILE PLUME SIGNATURE SIMULATION

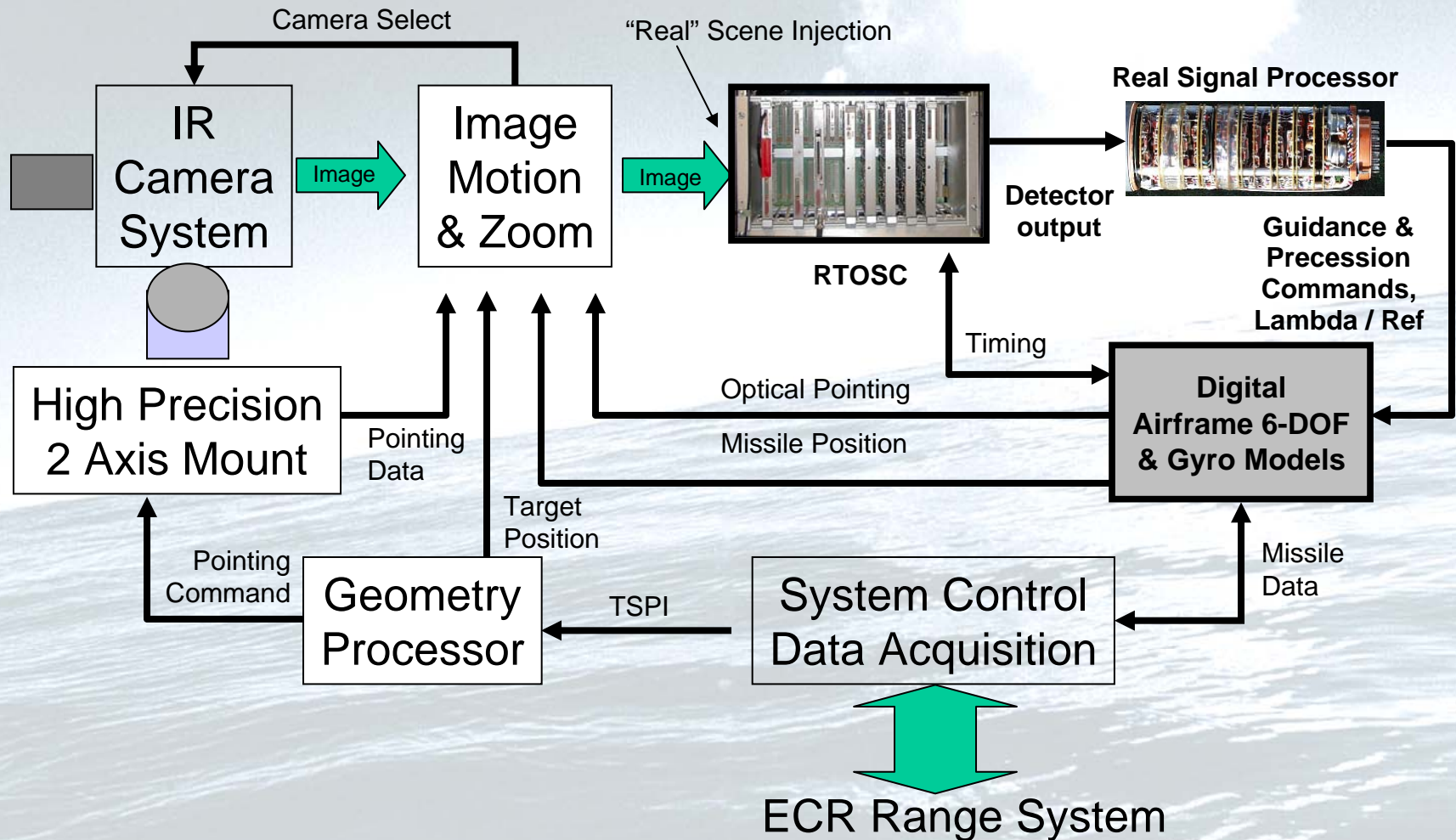


INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

- **1 v 1 - 1 Aircraft versus 1 Threat (FY-03)**
 - UV Stimulator, Fire & Forget Missile (FFM), Zoom Optics, Fly-Out Model, Ozone Atmospheric
- **1 v 2 - 1 aircraft versus 2 threats (FY-04)**
 - Adds IR Stimulator, IR Target Array, & IR Atmospheric to 1 v 1
 - Closed-Loop ability to evaluate IR MWS & directed IR countermeasures
- **1 v Many - 1 aircraft versus many threats (FY-07)**
 - Additional seekers to FFM
 - Closed-Loop ability to evaluate end-game effectiveness for expendables and DIRCM countermeasures
- **Many v Many - Many aircraft versus many threats (FY-08/09)**
 - 1 v Many capability against 2 or more aircraft



CONCEPT FOR USE OF CONVOLVER



INFRARED COUNTERMEASURES ASSESSMENT SYSTEM (ICAS)

Conclusions

- T&E of installed IR warning and CM equipment requires an End-to-End approach and will dramatically improve with the availability of ICAS capabilities
- Evolutionary expansion of ICAS will produce a large range area in which developers and users can fly without significant constraints, conducting T&E, tactics assessment, mission rehearsal and unit training.
- As IR threat technology introduces multi-spectral, imaging seekers with powerful processing, ICAS will require enhancements but the fundamental facility concept can evolve to respond to any plausible future threat.

NAV  AIR